

## The Nurture of Nature: How Nature Supports Child Development Across Domains

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❖ *"Treat the earth well: it was not given to you by your parents, it was loaned to you by your children. We do not inherit the Earth from our Ancestors, we borrow it from our children."*

❖ Ancient Indian Proverb

*"It is not half so important to know as to feel. If facts are the seeds that later produce knowledge and wisdom, then the emotions and the impressions of the senses are the fertile soil in which the seeds must grow. **The years of early childhood are the time to prepare the soil.** Once the emotions have been aroused – a sense of the beautiful, the excitement of the new and the unknown, a feeling of sympathy, pity, admiration or love – then we wish for knowledge about the subject of our emotional response. It is **more important to pave the way for the child to want to know** than to put him on a diet of facts he is not ready to assimilate"*

❖ Rachel Carson, *Sense of Wonder*

## The Challenge

- ❖ Experience of many children today
  - ❖ Isolated from the world of nature
    - ❖ Children today spend less time playing outdoors than any previous generation (Clements, 2004; Hofferth & Curtin, 2006)
      - ❖ In one generation - just thirty years - kids are getting outdoors half as often as their parents (Klasky, 2014)
    - ❖ Children ages two-five years old now spend more than 37 hours a week on average in front of a TV screen (Nielson Company)
  - ❖ May grow up believing they are "separate from" versus "a part of" the world of nature

## The Challenge

- ❖ Increasing rates of
  - ❖ Challenging behavior (Brauner & Stephens, 2006)
    - ❖ Approximately 10-30% of all typically developing preschool children have chronic mild to moderate levels of behavior problems (Campbell, 1995; Fox & Smith, 2007)
  - ❖ Diagnoses of ADHD and Autism (Centers for Disease Control and Prevention, 2016)
  - ❖ Use of medication to address ADHD (CDC, 2009-2010 data)
    - ❖ About ½ of preschoolers with ADHD were taking medication for ADHD, and about 1 in 4 were treated only with medication.
    - ❖ Only half of preschoolers with ADHD received behavioral therapy, which is now recommended first-line treatment.

## The Decline of Play in Preschoolers – and the Rise in Sensory Issues



The decline of play in preschoolers — and the rise in sensory issues  
Source: [www.nature.com/news/decline-of-play-in-preschoolers-1.14444](http://www.nature.com/news/decline-of-play-in-preschoolers-1.14444)

- ❖ Preschool years are not only optimal for children to learn through play, but also a critical developmental period. If children are not given enough natural movement and play experiences, they start their academic careers with a disadvantage. They are more likely to be clumsy, have difficulty paying attention, trouble controlling their emotions, utilize poor problem-solving methods, and demonstrate difficulties with social interactions. We are consistently seeing sensory, motor, and cognitive issues pop up more and more in later childhood, partly because of inadequate opportunities to move and play at an early age.

## The Challenge

- ❖ Early educators are challenged
  - ❖ Preschool teachers consistently report children's challenging behavior as their greatest concern with teaching social-emotional skills as their second highest identified need (Alkon et al., 2003; Fox & Smith, 2007; Joseph & Stuin, 2003)
  - ❖ Preschool teachers have low self-efficacy with regards to science education (Greenfield et al., 2009)
  - ❖ Early educators in many countries report feeling uncomfortable teaching science to young children (Conezio & French, 2002; Kallery & Pillos, 2001)



## The Promise

### Benefits of comprehensive social-emotional supports

- ❖ Child Outcomes
  - ❖ Decreased number of children identified as having challenging behavior and referred for mental health services
  - ❖ Children understand and follow behavior expectations
  - ❖ Children support each other in following classroom expectations
  - ❖ Children are able to transition from one classroom to another without difficulty
  - ❖ Children adjust to the classroom more quickly
- ❖ Program Outcomes
  - ❖ Reduced referrals to outside experts
  - ❖ Elimination of time-out as a practice
  - ❖ Improvement in overall program quality
  - ❖ Increased use of comprehensive strategies and team planning
  - ❖ Changes in individual interventions
  - ❖ A 50% reduction in staff turnover
  - ❖ Improved staff satisfaction (Fox, Jack & Boyes, 2005)



## The Promise

### Benefits of connecting children with nature

- ❖ Research shows that children's social, psychological, academic and physical health is positively impacted when they have daily contact with nature
  - ❖ Supports multiple domains of development
  - ❖ Supports creativity and problem solving
  - ❖ Enhances cognitive abilities
  - ❖ Improves academic performance
  - ❖ Reduces ADD symptoms
  - ❖ Increases physical activity
  - ❖ Improves nutrition
  - ❖ Improves eyesight
  - ❖ Improves social relations
  - ❖ Improves self-discipline
  - ❖ Reduces stress



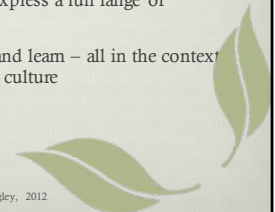
Image from Huffingtonpost.com

(naturallearning.org)

## Social-Emotional Development

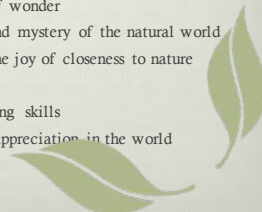
- ❖ For young children, social-emotional development includes the developing capacity to
  - ❖ Form close and secure adult and peer relationships
  - ❖ Experience, manage, and express a full range of emotions
  - ❖ Explore the environment and learn – all in the context of family, community and culture

Cohen, Oser & Quigley, 2012

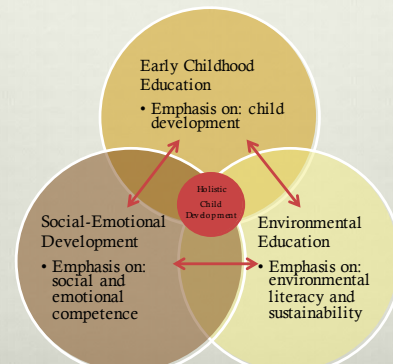


## Early Childhood Environmental Education

- ❖ Environmental education in early childhood is a holistic concept that encompasses knowledge of the natural world as well as emotions, dispositions, and skills (ECEE Programs: Guidelines for Excellence)
- ❖ ECEE includes (Wilson, 1994):
  - ❖ The development of a sense of wonder
  - ❖ Appreciation for the beauty and mystery of the natural world
  - ❖ Opportunities to experience the joy of closeness to nature
  - ❖ Respect for other creatures
  - ❖ Development of problem-solving skills
  - ❖ Development of interest and appreciation in the world around us



## Blending Approaches



## SEED Framework

Social-emotional & Environmental Education Development

- ❖ Developmentally Appropriate Practice (DAP)
  - ❖ National Association for the Education of Young Children (NAEYC; [www.naeyc.org](http://www.naeyc.org))
- ❖ The Pyramid Model for Promoting Social-Emotional Competence in Infants and Young Children
  - ❖ Center on the Social and Emotional Foundations for Early Learning (CSEFEL; <http://csefel.vanderbilt.edu>)
- ❖ Early Childhood Environmental Education Programs: Guidelines for Excellence
  - ❖ North American Association for Environmental Education (NAAEE; <https://naaee.org>)

## Guiding Principles

- ❖ Environment as third teacher – sets the stage for learning
  - ❖ *"It's the provocation, the invitation, the third teacher"*  
–Kumara Ward
- ❖ Children are learning all the time, whether we are intentionally teaching or not
- ❖ Caring as a central tenet

## Program Philosophy, Values & Expectations

Program  
philosophy, values  
& expectations

- ❖ Nature-centered
- ❖ Connection-based
- ❖ Goals target holistic child development & environmental literacy
- ❖ Focus on caring
  - ❖ Care for oneself
  - ❖ Care for others
  - ❖ Care for the world

## Fiddleheads Forest School



Children learn by engaging their senses and exploring the world around them

Aim to foster a sense of wonder & development of the whole child

Believe that a natural environment is an ideal setting for students to grow into citizens of the world; having a respect for all cultures and environments and a desire to engage with their communities

By emphasizing self-regulation, self-direction, and self-reflection, we provide children with the educational foundation that will support them for the rest of their lives

Child-led, hands-on experiences, experiments, and external resources.

Fiddleheads Forest School,  
Parent Handbook, 2014-2015

## SEED Expectation Matrix

Expectation	Outside
Take care of self	Dress appropriately Play safely Stay where you can see your teacher
Take care of others	Help each other Take turns Work it out with words
Take care of the environment	Tread gently Ask permission before collecting natural items Handle plants and animals gently and with respect Restore natural materials to where you found them when you leave

## Nurturing & Responsive Relationships

Nurturing & responsive relationships

Program philosophy, values & expectations

- ❖ Nurturing & responsive relationships with
  - ❖ Children
  - ❖ Families
  - ❖ Community
  - ❖ Environment



## Building Relationships

- ❖ Positive relationships are essential for
  - ❖ The development of personal responsibility
  - ❖ Capacity for self-regulation
  - ❖ Constructive interactions with others
  - ❖ Fostering academic functioning and mastery
- ❖ Warm, sensitive and responsive interactions
  - ❖ Help children develop a secure, positive sense of self
  - ❖ Encourage children to respect and cooperate with others
  - ❖ Help children gain the benefits of instructional experiences and resources

(NAEYC Early Childhood Program Standards)

*“Every child needs one person who is crazy about him.”*

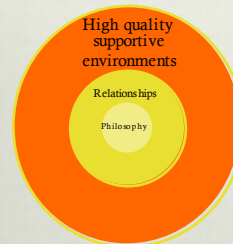
- Urie Bronfenbrenner



## Including Environments in Positive Relationships

- ❖ Children recognize that they are a part of the world of nature
- ❖ “Cultivating relationships with animals, both real and imagined, is one of the best ways to foster empathy during early childhood”
  - ❖ David Sobel
- ❖ Consider not just children's relationship with the environment, but that of adults

## High Quality Supportive Environments



- ❖ DAP
  - ❖ Safe & healthful, prepared environments
- ❖ Pyramid Model
  - ❖ Consistent, predictable, positive & safe
- ❖ ECEE Guidelines
  - ❖ Focus on nature, outside environments, & place-based education

## Natural Components integrated throughout places and spaces

- ❖ Outdoor spaces
  - ❖ Physical environment is varied and includes a spectrum of possibilities – ample shade, sunny spaces, windbreaks, open areas, small hiding places or refuges, gathering areas, areas for building, and areas for art and music and movement
  - ❖ Gardens, woods, natural pathways, and other natural elements are incorporated
  - ❖ Abundant “loose parts” (sticks, leaves, seeds, logs, stones), earth materials (soil, sand, and rocks), and “rough ground” (uneven, rocky, challenging areas)
  - ❖ Safe and supervised water features
  - ❖ Landscaped to invite appropriate wildlife, including birds and bugs

ECEE Guidelines for Excellence

## “Wild” Environments



Cedarong Nature School



www.themendsofthefells.org



Photo: Jenni Veal, Retrieved from Nooga.com



Cedarong Nature School

## Playground/Playscape Environments



Pagnaticmom.com



Adventurouschild.com



DIYandcraftsmag.com



Childsplaymag.com



1001gardens.org



Mauitprep.org

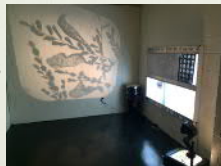
## Natural Components integrated throughout places and spaces

- ❖ Indoor spaces
  - ❖ "Sharing spaces" are included where children meet to get tools, supplies, look at bulletinboards, and so forth
  - ❖ Space is divided into clearly delineated areas for different kinds of activities, making sure that one activity does not interfere with another
  - ❖ Space is not visually overwhelming or over stimulating. Enough space is provided for contemplation and quiet personal time.
  - ❖ Plants are incorporated into the indoor environment
  - ❖ Live animals can be brought into the classroom
  - ❖ A range of natural resources are available: stones, pinecones, sand, rocks and minerals, shells, stumps, flowers, sticks, wood chunks or slices, herbs, seeds, water

ECEE Guidelines for Excellence

## Indoor Environments

Turning Sun School  
Atlanta, GA



## Turning Sun School Atlanta, GA



## Green Classroom Activities

- ❖ Worm bins for composting food scraps
- ❖ Outside areas for composting natural materials
- ❖ Reusable dishes and cloth napkins
- ❖ Recycle bins in the classroom
- ❖ Provide recycled materials for art projects
- ❖ Turn off lights when exiting a room to conserve energy
- ❖ Turn off faucets when not in use
- ❖ Examples of sustainable living materials in dramatic play area (e.g., cloth bags, empty healthy food boxes, etc.)

ECEE Guidelines for Excellence

## A Sense of Place

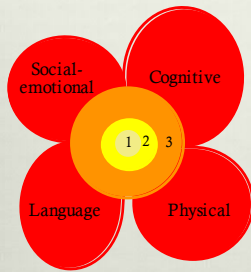
- ❖ *"You don't know who you are, unless you know where you are"*  
—Wendell Berry



Image from Jen Mendez at  
PERMIEKids.com



## Curriculum



- ❖ DAP: “The program implements a curriculum that is consistent with its goals for children and promotes learning and development in each of the following areas”
  - ❖ Social-emotional
  - ❖ Physical
  - ❖ Cognitive
  - ❖ Language

## Social-Emotional Development

- ❖ Nature provides
  - ❖ Dynamic conditions & experiences
  - ❖ Variety of interactions, including with plants and animals



Image from schitzaudubon.org



Image from primitivepunuts.com



## Social-Emotional

- ❖ Social-emotional growth
  - ❖ Opportunities to learn about self-concept and control
  - ❖ Sense of community promoted
- ❖ A personal sense of responsibility and caring toward others and the environment
  - ❖ Opportunities for extensive positive interactions with nature
  - ❖ Opportunities to participate in social interactions and learn appropriate social roles

ECEE: Guidelines for Excellence

## Encourage Observation of the Environment



Natural Beginnings,  
Underground Forest

## Encourage Observation of Self



Fiddleheads Forest School  
Zones of Regulation

## Encourage Cooperation



Vista Montessori School

## Encourage Appreciation and Respect



## Encourage Self-Reflection



## Encourage Expression

- ❖ Nature inspires creative expression



## Cognitive Development

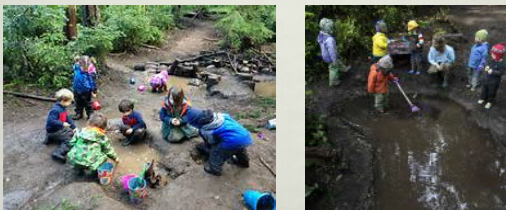
through direct experiences, exploration & discovery

- ❖ Curiosity & Questioning
  - ◊ Initiative & curiosity are encouraged
  - ◊ Questioning is encouraged & supported
  - ◊ Opportunities to practice reasoning & problem-solving are provided
- ❖ Development of Environmental Understandings
  - ◊ Opportunities to observe and understand earth systems
  - ◊ Opportunities to observe and understand the living environment
  - ◊ Interactions with individuals, groups and culture are provided
  - ◊ Emphasis is on developing the child's sense of place
- ❖ Skills for Understanding the Environment
  - ◊ Opportunities to observe, investigate, and analyze
  - ◊ Opportunities to collect, describe and record information
  - ◊ Flexibility, creativity and openness emphasized

ECEE Guidelines for Excellence

## Curiosity, Questioning & Investigation & the Scientific Process

- ❖ Evolving landscape encourages exploration and lends itself to scientific processes such as observing, questioning, predicting, experimenting, summarizing & sharing results (Gerde, Schachter & Wask, 2013)



## How Nature Play Supports STEM Thinking Skills and Conceptual Understanding in Early Learners



We need to look beyond the standards, the goal is to deepen the process of "doing" so that children are comfortable and fluent in the *practices of science, engineering and mathematics*

(Patty Bom, NAAEE Conference 2016)



## How Nature Play Supports STEM Thinking Skills and Conceptual Understanding in Early Learners

- ❖ Children engage in fundamental thinking skills associated with STEM in the outdoors



(Patty Bom, NAAEE Conference 2016)

## How Nature Play Supports STEM Thinking Skills and Conceptual Understanding in Early Learners

- ❖ Teachers support children's engagement in scientific thinking through:
  - ❖ Asking productive questions
  - ❖ Giving them time to investigate deeply
  - ❖ Allowing them to take "measured risks"
  - ❖ Listening closely to their observations and questions



(Patty Bom, NAAEE Conference 2016)



## Language Development

- ❖ Rich opportunities to practice expressive and receptive language skills
  - ❖ New vocabulary words
  - ❖ Concrete definitions/examples



Image from  
naturekindergarten.com



Image from childhood101.com



## STEM Language

- |               |                             |
|---------------|-----------------------------|
| ❖ Observation | ❖ Pattern                   |
| ❖ Theory      | ❖ Up/down/over/next to      |
| ❖ Investigate | ❖ Wet/dry                   |
| ❖ Test        | ❖ Hot/cold                  |
| ❖ Explore     | ❖ Seasons                   |
| ❖ Measure     | ❖ Build                     |
| ❖ Estimate    | ❖ Distance, direction, etc. |



## Physical Health & Development

- ❖ Opportunities to develop fine motor skills
  - ❖ Using tools & toys to explore their natural environment (e.g., magnifying glass, hand trowel, sifter, nets & tweezers)
  - ❖ Artistically expressing experiences in nature (e.g., tree & leaf rubbings, weaving through tree limbs, easel painting) to develop hand-eye coordination
  - ❖ Building two- and three-dimensional structures in the outdoor environment
  - ❖ Engaging in sensory exploration of the environment

ECEE Guidelines for Excellence

## Fine Motor Development

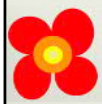


Cedarong Nature School



Image from Deb Carter





## Physical Health & Development

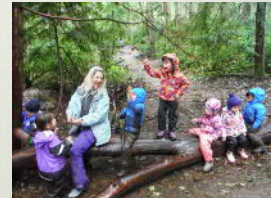
- ❖ Opportunities to develop gross motor skills
  - ❖ Walking, running and climbing on uneven surfaces such as hills, trails, depressions and tree trunks
  - ❖ Expressing through movement and dance the sounds of nature (e.g., wind, rain, falling leaves, animals)
  - ❖ Using garden tools to improve strength and coordination
  - ❖ Engaging in games and outdoor play activities that enhance physical wellness, balance, and coordination
  - ❖ Manipulating and combining a variety of natural and human-manufactured materials to enhance play

ECEE Guidelines for Excellence

## Gross Motor Development



Image from littlecocofootprints.com



Cedar.org Nature School



## Physical Health & Development

- ❖ The environment is used to promote children's health and fitness
  - ❖ Understand that all animals, including humans, need air, water, space, and food to live
  - ❖ Become aware that nutritious foods give us energy and help people to grow
  - ❖ Identify healthy and nonhealthy foods and be willing to try new, healthy foods
  - ❖ Participate in vegetable gardening
  - ❖ Be able to follow basic health and safety rules, especially when playing and exploring outdoors

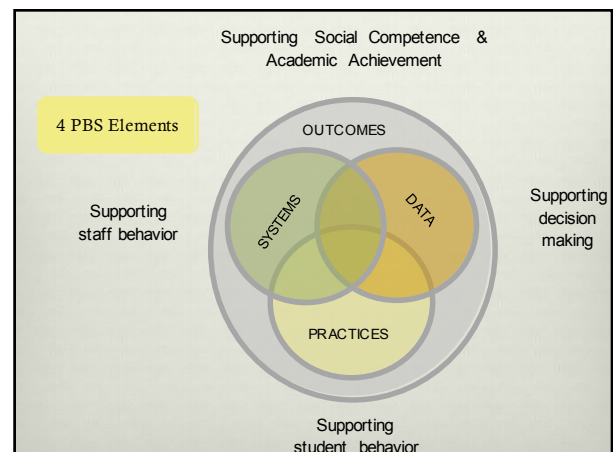
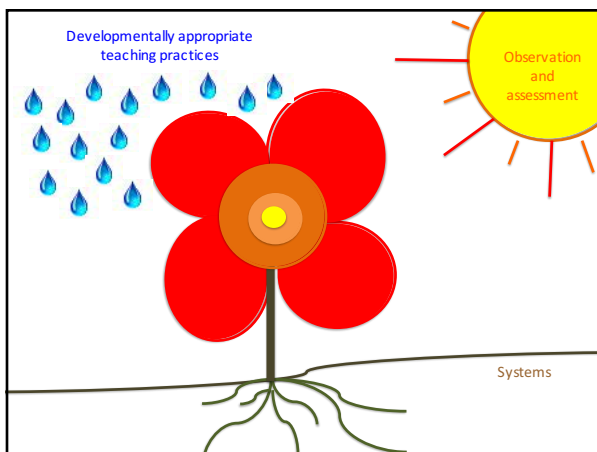
ECEE Guidelines for Excellence

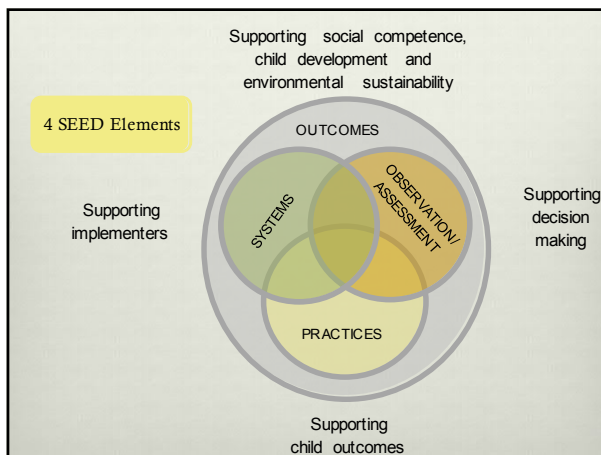
## Health

- ❖ Gardening
  - ❖ Learning opportunities on nutrition
  - ❖ Encourages healthy eating habits



Image from www.oxy.edu






## Play and Exploration



- ❖ Learning is supported through authentic, inquiry-based opportunities
- ❖ Children are provided ample opportunities for play and exploration
- ❖ The natural world provides
  - ❖ Whole body, multi-sensory experiences
  - ❖ A rich context for curiosity, questioning and experimenting
  - ❖ Opportunities to develop an emotional connection with the environment


NAAEE Guidelines

## Caring




- ❖ Recommendations for teaching caring
  - ❖ Modeling
    - ❖ First provide children with opportunities to experience what it means to be cared for
  - ❖ Dialogue
    - ❖ Allows educators and students to become familiar with one another, to arrive at well-informed decisions about caring behaviors, and to permit educators to talk with students about what they are trying to show
  - ❖ Practice
    - ❖ Practice is essential for authentic experience and can be intentionally planned for
  - ❖ Confirmation
    - ❖ Seeing and encouraging the best in children
      - ❖ "Identify something admirable, or at least acceptable, struggling to emerge in each person we encounter" (Noddings, 1995, p. 192)

(Noddings, 1984)



## Conducting observation and assessment to support decision-making



## Observation

- ❖ A comprehensive and flexible approach to both **modeling important skills** for young children and to **observing the dynamic interactions** between children and their environment in order to **guide program curriculum and activities**
- ❖ Observation and assessment includes objective evaluation of implementation and program outcomes in each area of the framework

## Observation



- ❖ We want teachers to experience the “awe” with the children. When they record observations of the students, they experience the awe.

- Kumara Ward



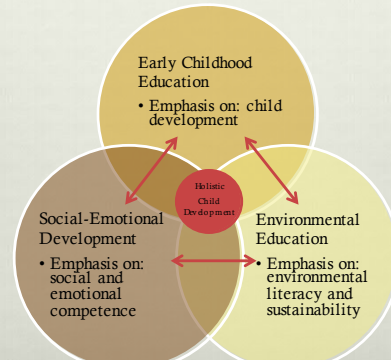
## Designing systems to support program implementers

## Systems



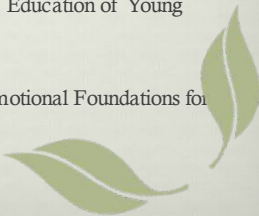
- ❖ Initial implementation
- ❖ Sustainability of practices over time

*How can your program seamlessly blend approaches?*



## Resources

- ❖ Natural Start Alliance; a project of the North American Association for Environmental Education ([www.naaee.org](http://www.naaee.org))
  - ❖ <http://naturalstart.org>
- ❖ National Association for the Education of Young Children
  - ❖ [www.naeyc.org](http://www.naeyc.org)
- ❖ Center on the Social and Emotional Foundations for Early Learning (CSEFEL)
  - ❖ <http://csefel.vanderbilt.edu>



## Thank you!

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